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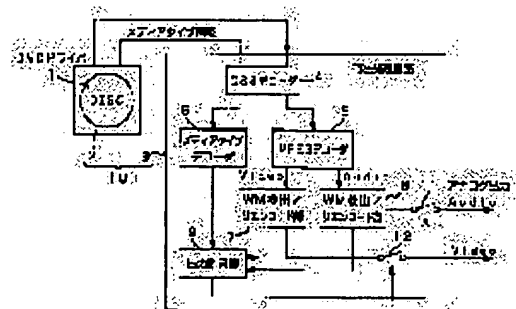
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(54) REPRODUCING DEVICE AND METHOD, RECORDING MEDIUM, SIGNAL PROCESSING DEVICE, AND SIGNAL PROCESSING METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To make limitable the reproduction with high reliability with respect to reformation of contents by an unjust copy, a piratic action, and the like.

SOLUTION: The reproducing device is provided with a read-out means 2 reading out each signal from a recording medium 1, in which superimposed signals on which the same copyright information is superimposed is recorded in at least top channels or more by electronic watermark processing for an original signal about contents having plural channels, a reproducing means 5 generating a reproduced signal of each channel from the read out superimposed signal, copyright information detecting means 7, 8 detecting copyright information of each channel from the generated produced signal, and a control means 9 outputting a reproduced signal of each channel when copyright information detected by the copyright information detecting means 7, 8 are mutually the same for two channels or more.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a regenerative apparatus and an approach, a record medium, the regenerative apparatus with which the playback limit to an illegal copy, piracy, etc. was strengthened in detail by the list about the signal processor and the signal-processing approach.

[0002]

[Description of the Prior Art] Infringement of the copyright by the unjust copy about the so-called digital work poses a problem by the spread of the Internet, DVD (Digital Video Disc), digital satellite broadcasting services, etc.

[0003] Although correspondence was achieved about the copy of a digital work by performing generation control of a copy, for example by methods, such as CGMS (Copy Generation Management System), the copy control signal by this CGMS method had the problem of being easy to be changed easily. Moreover, in order to aim at thoroughness of an illegal copy or prevention of the so-called piracy, it is necessary to perform not only the record (copy) limit at the time of record but the playback limit at the time of playback.

[0004]

[Problem(s) to be Solved by the Invention] On the other hand, the technique called the digital-watermarking processing which makes digital data hide a certain information in its hand attracts attention in recent years. This digital-watermarking processing embeds the watermark information called the so-called watermark (Water Mark) as a noise into the part which is not [on the consciousness of human being who exists in the above-mentioned digital data] important.

[0005] Since according to this digital-watermarking processing it is hard to remove the embedded watermark and detection of this watermark can be performed also on a digital interface or an analog interface, it is possible to use the above-mentioned watermark as copy control information about a generation limit of a copy.

[0006] Relation with the watermark information at the time of using the CGMS-D (Copy Generation Management System-Digital) signal in the media type of a disk-like record medium and the CGMS method mentioned above and a watermark as copy control information is shown in Table 1.

[0007]

[Table 1]

Read Only Disc		Rewritable Disc	
CGMS-D	Watermark	CGMS-D	Watermark
(0,0)	non-marked	(0,0)	non-marked
	copy-free		copy-free
(1,1)	non-marked	(1,1)	non-marked
	never-copy		no-more-copy
(1,0)	non-marked	(1,0)	non-marked
	one-copy		one-copy

[0008] Here, it is divided into read-only Read Only Disc (henceforth a ROM disk), and Rewritable Disc (henceforth a RAM disk) in which writing and rewriting are possible about a media type.

[0009] Moreover, about a CGMS-D signal, there are three kinds of signals, (1, 1), and (1, 0), and it is displayed by 2 bits, respectively. [(0 0), and] Here, it is shown, respectively that (1, 1) may restrict the ban on a copy to one, (0) may restrict those without a copy limit to one generation, and (0, 0) may copy them.

[0010] furthermore, the condition that any marks are not inserted for "non-marked" about watermark information -- being shown -- the above -- which media type -- the above (0 0) of CGMS-D, and (1, 1) -- in and (1 0), the disk which is in the condition of this non-marked exists about all. [and] Moreover, watermark information is made into "copy-free" when displaying about the condition of the above (0 0) of CGMS-D, and when displaying about the condition of the above (1 0), it is made into "one-copy."

[0011] Furthermore, a watermark is made [ROM disk] into "no-more-copy" about a RAM disk as "never-copy", when displaying about the condition of the above (1 1) of CGMS-D. That is, the watermark of "never-copy" is used only about a read-only ROM disk, and uses the watermark of "no-more-copy" only about a recordable RAM disk.

[0012] In addition, it is shown that "no-more-copy" about a RAM disk is in the condition which this disk copied from the ROM disk or RAM disk of the above "one-copy." That is, in copying to a RAM disk from the disk of "one-copy", it means that the watermark of this "one-copy" is rewritten by "no-more-copy."

[0013] Next, the example of the disk by the illegal copy is shown in Table 2.

[0014]

[Table 2]

Media Type	Watermark
Read Only Disc	no-more-copy
Rewritable Disc	never-copy

[0015] Since this "no-more-copy" is the watermark used only about a RAM disk when the watermark of "no-more-copy" is detected from a ROM disk as shown in this table 2, this disk will be called an illegal copy disk. For example, the so-called disk of the pirate edition which *****ed as it is and mass-produced the RAM disk to which the watermark of "no-more-copy" was given corresponds.

[0016] Moreover, since the watermark of this "never-copy" is a watermark used only about a ROM disk when the watermark of "never-copy" is detected from a RAM disk, this disk will be called an illegal copy disk.

[0017] And the DVD regenerative apparatus 100 as shown in drawing 4 was proposed as what performs a playback limit of the DVD disk by the illegal copy using the watermark as such copy control information.

[0018] It is suitably used as a system of a personal computer, and the DVD driver 102 which reads the signal recorded on DVD101, and the regeneration circuit 103 which regenerates about the signal read from the DVD driver 102 are connected by the cable or bus of dedication, and this DVD regenerative apparatus 100 is constituted.

[0019] The video signal about an animation or a still picture and the audio signal about music, voice, etc. are recorded on the data area by DVD101 as MPEG data compressed by the MPEG (moving picture coding experts group) method. And in this DVD101, the information about the watermark mentioned above is recorded about the above-mentioned video signal as MPEG data on which digital-watermarking processing was overlapped.

[0020] Furthermore, media type information and the CGMS-D signal mentioned above are recorded on DVD101 as sub-code information. Here, media type information is information which shows a ROM disk with the read-only disk concerned, or a recordable RAM disk. Moreover, the CGMS-D signal is inserted into the above-mentioned MPEG data, and can be detected now from the both sides of a video signal and an audio signal.

[0021] The DVD driver 102 reads the MPEG data and media type information which came to have the optical pickup which is not illustrated and were mentioned above from DVD101 as a bit stream signal, and supplies them to the regeneration circuit 103. This bit stream signal is transmitted to the

regeneration circuit 103, after the above-mentioned MPEG data and media type information have applied the scramble by CSS (Contents Scramble System).

[0022] Here, with the CSS decoder 104, the MPEG decoding section 105, the media type decoder 106, the watermark (WM) detection / Lien code section 107, and the output-control section 108, it has the switch 111, 112 grade, and each [these] block is built in the so-called PC card etc., and the regeneration circuit 103 is constituted.

[0023] And in the regeneration circuit 103 where the bit stream signal was inputted, the CSS decoder 104 performs predetermined authentication processing using a cryptographic key. Here, when not attested correctly, the scramble of Above CSS will not be decoded but regeneration after this will be performed. And when the above-mentioned authentication which used the cryptographic key is performed correctly, the CSS decoder 104 decodes the scramble of CSS, takes out the above-mentioned MPEG data and media type information, and supplies them to the MPEG decoding section 105 and the media type decoder 106, respectively.

[0024] The MPEG decoding section 105 decodes the inputted MPEG data, and divides them into the video data superimposed on audio data and a watermark. After the MPEG decoding section 105 processes D/A conversion etc. about audio data, it is outputted to a switch 111, and it outputs to WM detection / Lien code section 107 about the video data (henceforth a superposition video data) superimposed on the watermark.

[0025] WM detection / Lien code section 107 outputs the information about any of "non-marked", "copy-free", "never-copy" and "no-more-copy" which detected and mentioned the watermark above, and "one-copy" they are from this superposition video data to the output-control section 108. Moreover, as a result of detecting a watermark as mentioned above, when this watermark is "one-copy", WM detection / Lien code section 107 performs RIEN code processing to the above-mentioned video data so that this watermark may be made into "no-more-copy", it carries out D/A conversion of the signal after processing, and supplies it to a switch 112. In addition, when this watermark is except "one-copy", without performing RIEN code processing, WM detection / Lien code section 107 carries out D/A conversion of the superposition video data, and supplies it to a switch 112.

[0026] On the other hand, the media type decoder 106 outputs the information about whether DVD101 which decodes the above-mentioned media type information and is reproduced is a ROM disk, or it is a RAM disk to the output-control section 108.

[0027] The output-control section 108 controls ON/OFF of a switch 111, 112 based on each information inputted from the media type decoder 106, and the WM detection / Lien code section 107. When a watermark is the case where the media type of DVD101 is [a watermark] "no-more-copy" in a "ROM disk" and this media type is "never-copy" in a "RAM disk", the output-control section 108 is controlled to regard it as an illegal copy and to turn OFF each switch 111, 112, and it is made not to specifically output an audio signal and a superposition video signal based on each information from the media type decoder 106, and the WM detection / Lien code section 107.

[0028] However, the following troubles were pointed out in such a DVD regenerative apparatus 100. That is, the alteration of a watermark had the problem that there was no means to detect that alteration, in the DVD regenerative apparatus 100, when it changed this watermark into the condition of "non-marked" by taking out the regenerative signal of the DVD driver 102 through a bus, and changing the information on a watermark since it is not by any means impossible for example.

[0029] Moreover, in the DVD regenerative apparatus 100, since only the information on a watermark was referred to as mentioned above, to the attack about the alteration by the above-mentioned piracy, it was weak and there was a trouble that a possibility that DVD101 by the illegal copy may be reproduced as it is was strong.

[0030] Furthermore, in the DVD regenerative apparatus 100, since the audio signal outputted was not overlapped on the watermark, when DVD101 with which the contents of a movie were recorded, for example was reproduced, the illegal copy of a sound track was performed and there was a possibility that BGV software might be created by audio postrecording contrary to an intention of a rightful claimant.

[0031] This invention is proposed in view of such the actual condition, and aims at providing with a signal processor and the signal-processing approach the regenerative apparatus which enabled the reliable playback limit to the contents alteration by the illegal copy, piracy, etc. and an approach, a

record medium, and a list.

[0032]

[Means for Solving the Problem] As opposed to the HARASHIN number about the contents which have two or more channels in order that the regenerative apparatus concerning this invention may solve the above-mentioned technical problem by digital-watermarking processing The read-out means which reads a superposition signal from the record medium with which the superposition signal which superimposed the same copyright information on at least two or more channels was recorded, A playback means to generate the regenerative signal of each channel from the read superposition signal, It has a copyright information detection means to detect the copyright information on each channel from the generated regenerative signal, and the control means which outputs the regenerative signal of each channel when the copyright information which the copyright information detection means detected is the same to mutual about two or more channels.

[0033] In a regenerative apparatus, when the copyright information which the copyright information detection means detected [the control means] is the same to mutual about two or more channels, the regenerative signal of each channel is outputted.

[0034] As opposed to the HARASHIN number about the contents which have two or more channels in order that the playback approach concerning this invention may solve the above-mentioned technical problem by digital-watermarking processing A superposition signal is read from the record medium with which the superposition signal which superimposed the same copyright information on at least two or more channels was recorded. From the read superposition signal, the regenerative signal of each channel is generated, and when the copyright information which detected and detected the copyright information on each channel from the generated regenerative signal is the same to mutual about two or more channels, the regenerative signal of each channel is outputted.

[0035] In the playback approach, two or more copyright information is detected from the regenerative signal which generated the regenerative signal of two or more channels, and was generated from the superposition signal read from the record medium, and when these copyright information is the same to mutual, the regenerative signal of each channel is outputted.

[0036] The record medium concerning this invention is characterized by recording the superposition signal which superimposed the same copyright information on at least two or more channels by digital-watermarking processing to the HARASHIN number about the contents which have two or more channels in order to solve the above-mentioned technical problem.

[0037] Moreover, the record medium concerning this invention is characterized by recording the superposition signal which superimposed ID information which shows that they are the same contents on at least two or more channels by digital-watermarking processing to the HARASHIN number about the contents which have two or more channels in order to solve the above-mentioned technical problem.

[0038] As opposed to the HARASHIN number about the contents which have two or more channels in order that the regenerative apparatus concerning this invention may solve the above-mentioned technical problem moreover, by digital-watermarking processing The read-out means which reads a superposition signal from the record medium with which the superposition signal which superimposed ID information which shows that they are the same contents on at least two or more channels was recorded, A playback means to generate the regenerative signal of each channel from the read superposition signal, It has an ID detection means to detect ID information on each channel from the generated regenerative signal, and the control means which outputs the regenerative signal of each channel when ID information which ID detection means detected is the same to mutual about two or more channels.

[0039] In a regenerative apparatus, when ID information which ID detection means detected [the control means] is the same to mutual about two or more channels, the regenerative signal of each channel is outputted.

[0040] As opposed to the HARASHIN number about the contents which have two or more channels in order that the playback approach concerning this invention may solve the above-mentioned technical problem moreover, by digital-watermarking processing A superposition signal is read from the record medium with which the superposition signal which superimposed ID information which shows that they are the same contents on at least two or more channels was recorded. From the read superposition signal, the regenerative signal of each channel is generated, and when ID information which detected and detected ID information on each channel from the generated regenerative signal is the same to mutual

about two or more channels, the regenerative signal of each channel is outputted.

[0041] In the playback approach, two or more ID information is detected from the regenerative signal which generated the regenerative signal of two or more channels, and was generated from the superposition signal read from the record medium, and when these ID information is the same to mutual, the regenerative signal of each channel is outputted.

[0042] As opposed to the HARASHIN number about the contents which have two or more channels in order that the signal processor concerning this invention may solve the above-mentioned technical problem by digital-watermarking processing An input means to input into at least two or more channels the superposition signal which superimposed the same duplicate control information, A playback means to generate the regenerative signal of each channel from the inputted superposition signal, It has a copyright information detection means to detect the copyright information on each channel from the generated regenerative signal, and the control means which outputs the regenerative signal of each channel when the copyright information which the copyright information detection means detected is the same to mutual about two or more channels.

[0043] In a signal processor, when the copyright information which the copyright information detection means detected [the control means] is the same to mutual about two or more channels, the regenerative signal of each channel is outputted.

[0044] As opposed to the HARASHIN number about the contents which have two or more channels in order that the signal-processing approach concerning this invention may solve the above-mentioned technical problem by digital-watermarking processing The superposition signal which superimposed the same copyright information is inputted into at least two or more channels. From the inputted superposition signal, the regenerative signal of each channel is generated, and when the copyright information which detected and detected the copyright information on each channel from the generated regenerative signal is the same to mutual about two or more channels, the regenerative signal of each channel is outputted.

[0045] In the signal-processing approach, two or more duplicate control information is detected from the regenerative signal which generated the regenerative signal of two or more channels, and was generated from the inputted superposition signal, and when these duplicate control information is the same to mutual, the regenerative signal of each channel is outputted.

[0046] As opposed to the HARASHIN number about the contents which have two or more channels in order that the signal processor concerning this invention may solve the above-mentioned technical problem moreover, by digital-watermarking processing An input means to input into at least two or more channels the superposition signal which superimposed ID information which shows that they are the same contents, A playback means to generate the regenerative signal of each channel from the inputted superposition signal, It has an ID detection means to detect ID information from the generated regenerative signal, and the control means which outputs the regenerative signal of each channel when ID information which ID detection means detected is the same to mutual about two or more channels.

[0047] In a signal processor, when ID information which ID detection means detected [the control means] is the same to mutual about two or more channels, the regenerative signal of each channel is outputted.

[0048] As opposed to the HARASHIN number about the contents which have two or more channels in order that the signal-processing approach concerning this invention may solve the above-mentioned technical problem furthermore, by digital-watermarking processing The superposition signal which superimposed ID information which shows that they are the same contents is inputted into at least two or more channels. The superposition signal inputted from the inputted superposition signal when ID information which detected and detected ID information from the superposition signal which generated the regenerative signal of each channel and was generated was the same to mutual about two or more channels is outputted.

[0049] In the signal-processing approach, two or more ID information is detected from the regenerative signal which generated the regenerative signal of two or more channels, and was generated from the inputted superposition signal, and when these ID information is the same to mutual, the regenerative signal of each channel is outputted.

[0050]

[Embodiment of the Invention] It explains to a detail, referring to a drawing per gestalt of operation of

this invention. The DVD regenerative apparatus 10 shown in drawing 1 performs a playback limit of DVD by the illegal copy using a watermark, and the DVD driver 2 which reads the signal recorded on DVD1, and the regeneration circuit 3 which regenerates about the signal read from the DVD driver 2 are connected by the cable or bus of dedication, and it is constituted.

[0051] The video signal about an animation or a still picture and the audio signal about music, voice, etc. are recorded on the data area by DVD1 as MPEG data compressed by the MPEG (moving picture coding experts group) method. And in this DVD1, digital-watermarking processing is overlapped on the information about the watermark as copy generation information shown in the above-mentioned table 1 about each of the above-mentioned video signal and an audio signal.

[0052] In DVD1, it is superimposed on the information about the same watermark about each of the above-mentioned video signal and an audio signal. That is, when the video signal is overlapped on the watermark about "one-copy", the audio signal will also be overlapped on the watermark about "one-copy."

[0053] In addition, when it superimposes the information about the same watermark about each of a video signal and an audio signal, it is made to superimpose by mutually different method. thus, since the method of capturing video and two kinds of watermarks of an audio must be invented by carrying out also to the so-called piracy which adds an alteration to a regenerative signal from DVD1, as compared with conventional DVD101 which superimposed the information about a watermark only on the video signal, the reinforcement to an alteration action is markedly alike, and improves.

[0054] Furthermore, media type information and the CGMS-D signal mentioned above are recorded on DVD1 as sub-code information. Here, media type information is information which shows a ROM disk with the read-only disk concerned, or a recordable RAM disk. Moreover, the CGMS-D signal is inserted into the above-mentioned MPEG data, and can be detected now from the both sides of a video signal and an audio signal.

[0055] The DVD driver 2 reads the MPEG data and media type information which came to have the optical pickup which is not illustrated and were mentioned above from DVD1 as a bit stream signal, and supplies them to the regeneration circuit 3. This bit stream signal is transmitted to the regeneration circuit 3, after the above-mentioned MPEG data and media type information have applied the scramble by CSS (Contents Scramble System).

[0056] Here, it has the CSS decoder 4, the MPEG decoder 5, the media type decoder 6, the watermark (WM) detection / Lien code section 7 about a video signal, the WM detection / Lien code section 8 about an audio signal, the output-control section 9, and a switch 11 and 12 grades, and each [these] block is built in the so-called PC card etc., and the regeneration circuit 3 is constituted.

[0057] And in the regeneration circuit 3 where the bit stream signal was inputted, the CSS decoder 4 performs predetermined authentication processing using a cryptographic key. Here, when not attested correctly, the scramble of Above CSS will not be decoded but regeneration after this will be performed. And when the above-mentioned authentication which used the cryptographic key is performed correctly, the CSS decoder 4 decodes the scramble of CSS, takes out the above-mentioned MPEG data and media type information, and supplies them to the MPEG decoder 5 and the media type decoder 6, respectively.

[0058] The MPEG decoder 5 decodes the inputted MPEG data, and divides them into the audio data (henceforth superposition audio data) with which it was superimposed on the video data (henceforth a superposition video data) superimposed on the watermark, and the watermark. The MPEG decoder 5 outputs to WM detection / Lien code section 7 about a superposition video data, and outputs to WM detection / Lien code section 8 about superposition audio data.

[0059] WM detection / Lien code section 7 outputs the information about any of "non-marked", "copy-free", "never-copy" and "no-more-copy" which detected and mentioned the watermark above, and "one-copy" they are from this superposition video data to the output-control section 9. Moreover, as a result of detecting a watermark as mentioned above, when this watermark is "one-copy", WM detection / Lien code section 7 performs RIEN code processing to the above-mentioned video data so that this watermark may be made into "no-more-copy", it carries out D/A conversion of the signal after processing, and supplies it to a switch 12. In addition, when this watermark is except "one-copy", without performing RIEN code processing, WM detection / Lien code section 7 carries out D/A conversion of the superposition video data, and supplies it to a switch 12.

[0060] WM detection / Lien code section 8 performs the same processing as WM detection / Lien code

section 7 mentioned above. That is, WM detection / Lien code section 8 outputs the information about any of "non-marked", "copy-free", "never-copy" and "no-more-copy" which detected and mentioned the watermark above, and "one-copy" they are from superposition audio data to the output-control section 9. Moreover, as a result of detecting a watermark, when this watermark is "one-copy", WM detection / Lien code section 8 performs RIEN code processing to the above-mentioned audio data so that this watermark may be made into "no-more-copy", it carries out D/A conversion of the signal after processing, and supplies it to a switch 11. In addition, when this watermark is except "one-copy", without performing RIEN code processing, WM detection / Lien code section 8 carries out D/A conversion of the superposition audio data, and supplies them to a switch 11.

[0061] The media type decoder 6 outputs the information about whether DVD1 which decodes the above-mentioned media type information and is reproduced is the above-mentioned ROM disk, or it is a RAM disk to the output-control section 9.

[0062] The output-control section 9 controls ON/OFF of switches 11 and 12 based on each information inputted from the media type decoder 6, the WM detection / Lien code section 7, and the WM detection / Lien code section 8. The output-control section 9 is specifically based on each information from the media type decoder 6, the WM detection / Lien code section 7, and the WM detection / Lien code section 8. When the media type of DVD1 is [a watermark] "no-more-copy" in a "ROM disk", Or it controls so that this media type regards it as an illegal copy by the "RAM disk" in the case of the combination shown in the table [watermark] 2 "never-copy" and turns OFF each switches 11 and 12. It is made not to output a superposition audio signal and a superposition video signal.

[0063] Moreover, when the detected watermarks differ mutually based on each information from WM detection / Lien code section 7, and the WM detection / Lien code section 8, the output-control section 9 is controlled to regard it as an illegal copy and to turn OFF each switches 11 and 12, and it is made not to output an audio signal and a superposition video signal. For example, it is because the case where the watermark about an audio is "no-more-copy" etc. corresponds by "non-marked" and the watermark about video is accepted to be what had an alteration action about the watermark of video in this case.

[0064] And based on each information from WM detection / Lien code section 7, and the WM detection / Lien code section 8, the media type and watermark of DVD1 do not correspond to the combination shown in Table 2, and the output-control section 9 is restricted when the detected watermark is the same as mutual, it is controlled to turn ON each switches 11 and 12, and outputs a superposition audio signal and a superposition video signal outside.

[0065] Thus, in the regeneration circuit 3, it adds to the judgment about the so-called pirate edition shown in Table 2. Even if the judgment item "whether video and the watermark of an audio are in agreement" is added and it is an audio and a lawful combination as each of the watermark of video shows in Table 1 Since a playback limit works and each signal of an audio and video is not outputted when each watermarks differ, the playback limit to an illegal act can be strengthened.

[0066] In addition, although [an above-mentioned example] the information about the watermark as copy generation information shown in the above-mentioned table 1 about DVD1 is superimposed about each of the above-mentioned video signal and an audio signal by digital-watermarking processing, it is good also as superimposing ID information which shows that they are the same contents by digital-watermarking processing in addition to the information about this watermark.

[0067] That is, since the judgment item "whether ID information on video and an audio is in agreement" is further added in the regeneration circuit 3 by superimposing [DVD /1] the above-mentioned ID information about each of the above-mentioned video signal and an audio signal by digital-watermarking processing, a more positive playback limit is attained.

[0068] Furthermore, when the audio signal of DVD1 has multichannels, such as five to 1 stereo, it is good also as superimposing the information about the watermark as the above-mentioned copy generation information, and/or the above-mentioned ID information by digital-watermarking processing about each of that channel. In this case, WM detection / Lien code section 8 should just be made to process detection of the watermark mentioned above for every channel etc.

[0069] With reference to drawing 2 , it explains per gestalt of other operations of this invention. In addition, the same sign is given to the same part as drawing 1 . The DVD regenerative apparatus 20 shown in drawing 2 performs a playback limit of the DVD disk by the illegal copy using a watermark like the DVD regenerative apparatus 10 mentioned above, and connects and consists of the cables or

buses of dedication of the DVD driver 2 which reads the signal recorded on DVD1, and regeneration circuit 3A which regenerates about the signal read from the DVD driver 2.

[0070] Here, about DVD1 and the DVD driver 2, it is the same as that of DVD1 shown in drawing 1, and the DVD driver 2, and the explanation is omitted.

[0071] With the CSS decoder 4, the MPEG decoder 5, the media type decoder 6, the WM detection / Lien code section 7 about a video signal, the WM detection / Lien code section 8 about an audio signal, the CGMS-D decoder 13 about a video signal, the CGMS-D decoder 14 about an audio signal, and the output-control section 15, it has switches 11 and 12, and each [these] block is built in the so-called PC card etc., and regeneration circuit 3A is constituted.

[0072] About the CSS decoder 4, the media type decoder 6, the WM detection / Lien code section 7, and the WM detection / Lien code section 8, since it is the same as that of what was shown in drawing 1, the explanation is omitted.

[0073] The MPEG decoder 5 decodes the inputted MPEG data, and divides them into a superposition video data and superposition audio data. This MPEG decoder 5 outputs to WM detection / Lien code section 7, and the CGMS-D decoder 13 about a superposition video data, and outputs to WM detection / Lien code section 8, and the CGMS-D decoder 14 about superposition audio data.

[0074] From the inputted superposition video data, the CGMS-D decoder 13 decodes the information about CGMS-D, and supplies the information about any of (1, 1), and (1, 0) which were mentioned above (0 0) they are to the output-control section 15. Similarly, the CGMS-D decoder 14 also supplies the information about any of (1, 1), and (1, 0) which decoded and mentioned the information about CGMS-D above from the inputted superposition audio data (0 0) they are to the output-control section 15.

[0075] The output-control section 15 controls ON/OFF of switches 11 and 12 based on each information inputted from the media type decoder 6, the WM detection / Lien code section 7, the WM detection / Lien code section 8, the CGMS-D decoder 13, and the CGMS-D decoder 14. The output-control section 9 is specifically based on each information from the media type decoder 6, the WM detection / Lien code section 7, and the WM detection / Lien code section 8. When the media type of DVD1 is [a watermark] "no-more-copy" in a "ROM disk", Or it controls so that this media type regards it as an illegal copy by the "RAM disk" in the case of the combination shown in the table [watermark] 2 "never-copy" and turns OFF each switches 11 and 12. It is made not to output a superposition audio signal and a superposition video signal.

[0076] Moreover, the output-control section 15 is controlled so that it regards it as an illegal copy by "non-marked" when the watermark about an audio is "no-more-copy", and the watermark about video when the detected watermarks differ mutually based on each information from WM detection / Lien code section 7, and the WM detection / Lien code section 8 turns OFF each switches 11 and 12, and it is made not to output a superposition audio signal and a superposition video signal.

[0077] Furthermore, when CGMS-D about video differs from CGMS-D about an audio mutually based on each information from the CGMS-D decoder 13 and the CGMS-D decoder 14, the output-control section 15 is controlled to regard it as an illegal copy and to turn OFF each switches 11 and 12, and it is made not to output a superposition audio signal and a superposition video signal.

[0078] The output-control section 15 is based on each information further again from WM detection / Lien code sections 7 and 8, and the CGMS-D decoders 13 and 14. When the correspondence relation between CGMS-D and a watermark is collated and there is no adjustment of these both, For example, CGMS-D controls to regard it as an illegal copy by (0, 0), case [whose watermark is / like "one-copy"], and to turn OFF each switches 11 and 12, and it is made not to output a superposition audio signal and a superposition video signal.

[0079] And the media type and watermark of DVD1 do not correspond to the combination shown in Table 2, but a watermark is the same as mutual, and that also of CGMS-D is the same as that of mutual, the output-control section 15 is restricted when there is adjustment of a watermark and CGMS-D further, it is controlled by each above-mentioned processing to turn ON each switches 11 and 12, and outputs a superposition audio signal and a superposition video signal outside.

[0080] thus, the judgment item by the regeneration circuit 3 shown in drawing 1 in regeneration circuit 3A -- in addition, since the judgment item whether CGMS-D "has the adjustment of a watermark and CGMS-D" "in accordance with mutual" is added further, while the alteration action to CGMS-D is also

detectable, it becomes still stronger to the alteration action to a watermark or CGMS-D.

[0081] In addition, also in the gestalt of this operation, although the information about the watermark as copy generation information shown in the above-mentioned table 1 about DVD1 is superimposed about each of the above-mentioned video signal and an audio signal by digital-watermarking processing, it is good also as superimposing ID information which replaces with the information about this watermark, or shows that they are the same contents in addition to the information concerned by digital-watermarking processing.

[0082] Furthermore, when the audio signal of DVD1 has multichannels, such as five to 1 stereo, the information about the watermark as the above-mentioned copy generation information and/or the above-mentioned ID information may be superimposed by digital-watermarking processing about each of that channel, and the information about above-mentioned CGMS-D may be inserted about each of that channel. In this case, what is necessary is to process detection of the watermark which WM detection / Lien code section 8 mentioned above for every channel etc., and just to perform decoding about CGMS-D which the CGMS-D decoder 14 mentioned above for every channel.

[0083] Although DVD was used for the gestalt of each operation mentioned above as a record medium, as for this invention, it is needless to say that it is not limited to this and other optical disks and magneto-optic disks of a class, such as CD (Compact Disc) and MD (Mini Disc), may be used.

[0084] Moreover, with the gestalt of each operation mentioned above, although the regenerative apparatus of DVD was explained, this invention is applicable also to the record limit at the time of record of DVD. Hereafter, the gestalt of operation of the recording device which applied this invention is explained.

[0085] The recording apparatus 30 shown in drawing 3 is equipped with WM detection / Lien code sections 7 and 8, switches 11 and 12, the output-control section 31, and the Records Department 32. Moreover, the recording apparatus 30 is connected with the optical disk regenerative apparatus 120 which reproduces DVD1 and outputs a superposition video data and superposition audio data.

[0086] WM detection / Lien code section 7 outputs the information about any of "non-marked", "copy-free", "never-copy" and "no-more-copy" which detected the watermark and were mentioned above from the superposition video data inputted from the optical disk regenerative apparatus 120, and "one-copy" they are to the output-control section 31. Moreover, as a result of detecting a watermark as mentioned above, when this watermark is "one-copy", WM detection / Lien code section 7 performs RIEN code processing to the above-mentioned video data so that this watermark may be made into "no-more-copy", it carries out D/A conversion of the signal after processing, and supplies it to a switch 12. In addition, when this watermark is except "one-copy", without performing RIEN code processing, WM detection / Lien code section 7 carries out D/A conversion of the superposition video data, and supplies it to a switch 12.

[0087] WM detection / Lien code section 8 performs the same processing as WM detection / Lien code section 7 mentioned above. That is, from the superposition audio data inputted from the optical disk regenerative apparatus 120, WM detection / Lien code section 8 detects a watermark, and outputs the information about any of "non-marked", "copy-free", "never-copy" and "no-more-copy" which were mentioned above, and "one-copy" they are to the output-control section 31. Moreover, as a result of detecting a watermark, when this watermark is "one-copy", WM detection / Lien code section 8 performs RIEN code processing to the above-mentioned audio data so that this watermark may be made into "no-more-copy", it carries out D/A conversion of the signal after processing, and supplies it to a switch 11. In addition, when this watermark is except "one-copy", without performing RIEN code processing, WM detection / Lien code section 8 carries out D/A conversion of the superposition audio data, and supplies them to a switch 11.

[0088] The output-control section 31 controls ON/OFF of switches 11 and 12 based on each information inputted from WM detection / Lien code section 7, and the WM detection / Lien code section 8. The output-control section 31 judges whether a watermark is mutually in agreement, and in not being in agreement, it is controlled to regard it as an illegal copy and to turn OFF each switches 11 and 12, and it makes it not specifically output a superposition audio signal and a superposition video signal to the Records Department 32 based on each information from WM detection / Lien code section 7, and the WM detection / Lien code section 8. When a watermark is mutually in agreement, the output-control section 31 is controlled to turn OFF switches 11 and 12, when the classes of the watermark concerned

are "never-copy" and "no-more-copy", and it is made not to output a superposition audio signal and a superposition video signal to the Records Department 32.

[0089] And the output-control section 31 is controlled to turn ON each switches 11 and 12, when the class of the watermark concerned is "non-marked", "copy-free", or "one-copy." Thereby, a superposition audio signal and a superposition video signal are supplied to the Records Department 32.

[0090] The Records Department 32 carries out predetermined signal processing to an output signal from WM detection / Lien code sections 7 and 8 which are supplied through switches 11 and 12, and records the signal after processing on it to a RAM type optical disk.

[0091] By considering as such a configuration, a recording device 30 can perform a record limit by performing the judgment about the identity of a watermark based on an input signal.

[0092]

[Effect of the Invention] As explained to the detail above, according to the regenerative apparatus concerning this invention, detection about whether a control means is what a record medium depends on an illegal copy, since the regenerative signal of each channel is outputted when the copyright information which the copyright information detection means detected is the same to mutual about two or more channels can be performed easily. Moreover, according to the regenerative apparatus, since those who are going to perform an alteration action about the signal from a read-out means have to change the copyright information about two or more channels, they become strong to such an alteration action.

[0093] Since according to the playback approach concerning this invention two or more copyright information is detected from the regenerative signal which generated the regenerative signal of two or more channels, and was generated from the superposition signal read from the record medium, and the regenerative signal of each channel is outputted when these copyright information is the same to mutual, detection about whether it is what a record medium depends on an illegal copy can be performed easily. Moreover, according to the playback approach, since those who are going to perform an alteration action about the signal about contents have to change the copyright information about two or more channels, they become strong to such an alteration action.

[0094] Since the signal which superimposed the same copyright information on at least two or more channels by digital-watermarking processing to the HARASHIN number about the contents which have two or more channels is recorded, the record medium concerning this invention can detect easily whether it is copied illegally by judging the identity of this copyright information on the occasion of contents playback. Moreover, since those who are going to perform the alteration action about the regenerative signal of this record medium have to change the copyright information about two or more channels, according to the record medium, they become strong to such an alteration action.

[0095] Since the signal which superimposed ID information which shows that they are the same contents on at least two or more channels by digital-watermarking processing is recorded to the HARASHIN number about the contents which have two or more channels, the record medium concerning this invention can detect easily whether it is copied illegally by judging the identity of this ID information on the occasion of contents playback. Moreover, since those who are going to perform the alteration action about the regenerative signal of this record medium have to change ID information about two or more channels, according to the record medium, they become strong to such an alteration action.

[0096] According to the regenerative apparatus concerning this invention, detection about whether a control means is what a record medium depends on an illegal copy, since the regenerative signal of each channel is outputted when ID information which ID detection means detected is the same to mutual about two or more channels can be performed easily. Moreover, according to the regenerative apparatus, since those who are going to perform an alteration action about the signal from a read-out means have to change ID information about two or more channels, they become strong to such an alteration action.

[0097] Since according to the playback approach concerning this invention two or more ID information is detected from the regenerative signal which generated the regenerative signal of two or more channels, and was generated from the superposition signal read from the record medium, and the regenerative signal of each channel is outputted when these ID information is the same to mutual, detection about whether it is what a record medium depends on an illegal copy can be performed easily. Moreover, according to the playback approach, since those who are going to perform an alteration action

about the signal about contents have to change ID information about two or more channels, they become strong to such an alteration action.

[0098] According to the signal processor concerning this invention, since a control means must change the copyright information about the channel of plurality [those / who are going to perform an alteration action about a superposition signal since the regenerative signal of each channel is outputted when the copyright information which the copyright information detection means detected is the same to mutual about two or more channels], it becomes strong to such an alteration action.

[0099] Since according to the signal-processing approach concerning this invention two or more duplicate control information is detected from the regenerative signal which generated the regenerative signal of two or more channels, and was generated from the inputted superposition signal, and the regenerative signal of each channel is outputted when these duplicate control information is the same to mutual, since those who are going to perform an alteration action about a superposition signal have to change the duplicate control information about two or more channels, they become strong to such an alteration action.

[0100] Moreover, according to the signal processor concerning this invention, since a control means must change ID information about the channel of plurality [those / who are going to perform an alteration action about a superposition signal since the regenerative signal of each channel is outputted when ID information which ID detection means detected is the same to mutual about two or more channels], it becomes strong to such an alteration action.

[0101] Since according to the signal-processing approach concerning this invention two or more ID information is detected from the regenerative signal which generated the regenerative signal of two or more channels, and was generated from the inputted superposition signal, and the regenerative signal of each channel is outputted when these ID information is the same to mutual, since those who are going to perform an alteration action about a superposition signal have to change ID information about two or more channels, they become strong to such an alteration action.

[Translation done.]

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 CLAIMS

[Claim(s)]

[Claim 1] As opposed to the HARASHIN number about the contents which have two or more channels by digital-watermarking processing The read-out means which reads the above-mentioned superposition signal from the record medium with which the superposition signal which superimposed the same copyright information on at least two or more channels was recorded, A playback means to generate the regenerative signal of each channel from the read above-mentioned superposition signal, A copyright information detection means to detect the above-mentioned copyright information on each channel from the generated regenerative signal, The regenerative apparatus characterized by having the control means which outputs the regenerative signal of each channel when the above-mentioned copyright information which the above-mentioned copyright information detection means detected is the same to mutual about two or more [above] channels.

[Claim 2] The above-mentioned read-out means is a regenerative apparatus according to claim 1 characterized by reading the superposition signal concerned from the record medium with which the superposition signal which superimposed the copyright information which includes the same duplicate control information in each of a video channel and an audio channel at least by digital-watermarking processing was recorded.

[Claim 3] It is the regenerative apparatus according to claim 2 which is equipped with a medium detection means to detect whether it is exclusively for playback about the above-mentioned record medium, and is characterized by the above-mentioned control means controlling the output of the regenerative signal of each channel based on the detection result of the above-mentioned medium detection means and the above-mentioned copyright information detection means.

[Claim 4] As opposed to the HARASHIN number about the contents which have two or more channels by digital-watermarking processing The above-mentioned superposition signal is read from the record medium with which the superposition signal which superimposed the same copyright information on at least two or more channels was recorded. The above-mentioned copyright information on each channel is detected from the regenerative signal which generated and generated the regenerative signal of each channel from the read superposition signal. The playback approach characterized by outputting the regenerative signal of each channel when the detected above-mentioned copyright information is the same to mutual about two or more [above] channels.

[Claim 5] The playback approach according to claim 4 characterized by reading the superposition signal concerned from the record medium with which the superposition signal which superimposed the copyright information which includes the same duplicate control information in each of a video channel and an audio channel at least by digital-watermarking processing was recorded.

[Claim 6] The playback approach according to claim 5 characterized by detecting whether it is exclusively for playback about the above-mentioned record medium, and controlling the output of the regenerative signal of each channel based on this detection result and the detection result of the above-mentioned copyright information.

[Claim 7] The record medium characterized by recording the superposition signal which superimposed the same copyright information on at least two or more channels by digital-watermarking processing to the HARASHIN number about the contents which have two or more channels.

[Claim 8] The record medium according to claim 7 characterized by recording the superposition signal which superimposed the copyright information which includes the same duplicate control information in

each of a video channel and an audio channel at least.

[Claim 9] The record medium characterized by recording the superposition signal which superimposed ID information which shows that they are the same contents on at least two or more channels by digital-watermarking processing to the HARASHIN number about the contents which have two or more channels.

[Claim 10] The record medium according to claim 9 characterized by recording the superposition signal which superimposed the same ID information on each of a video channel and an audio channel at least.

[Claim 11] The record medium according to claim 9 characterized by recording the superposition signal which superimposed the copyright information which includes the same duplicate control information in at least two or more channels.

[Claim 12] As opposed to the HARASHIN number about the contents which have two or more channels by digital-watermarking processing The read-out means which reads the above-mentioned superposition signal from the record medium with which the superposition signal which superimposed ID information which shows that they are the same contents on at least two or more channels was recorded, A playback means to generate the regenerative signal of each channel from the read superposition signal, The regenerative apparatus characterized by having an ID detection means to detect the above-mentioned ID information on each channel from the generated regenerative signal, and the control means which outputs the regenerative signal of each channel when the above-mentioned ID information which the above-mentioned ID detection means detected is the same to mutual about two or more [above] channels.

[Claim 13] The above-mentioned read-out means is a regenerative apparatus according to claim 12 characterized by reading the superposition signal concerned from the record medium with which the superposition signal which superimposed at least ID information which shows each of a video channel and an audio channel that they are the same contents by digital-watermarking processing was recorded.

[Claim 14] As opposed to the HARASHIN number about the contents which have two or more channels by digital-watermarking processing The above-mentioned superposition signal is read from the record medium with which the superposition signal which superimposed ID information which shows that they are the same contents on at least two or more channels was recorded. The above-mentioned ID information on each channel is detected from the regenerative signal which generated and generated the regenerative signal of each channel from the read superposition signal. The playback approach characterized by controlling the output of the regenerative signal of each channel when detected ID information is the same to mutual about two or more [above] channels.

[Claim 15] The playback approach according to claim 14 characterized by reading the superposition signal concerned from the record medium with which the superposition signal which superimposed at least ID information which shows each of a video channel and an audio channel that they are the same contents by digital-watermarking processing was recorded.

[Claim 16] As opposed to the HARASHIN number about the contents which have two or more channels by digital-watermarking processing An input means to input into at least two or more channels the superposition signal which superimposed the same copyright information, A playback means to generate the regenerative signal of each channel from the inputted above-mentioned superposition signal, A copyright information detection means to detect the above-mentioned copyright information on each channel from the generated regenerative signal, The signal processor characterized by having the control means which outputs the regenerative signal of each channel when the above-mentioned copyright information which the above-mentioned copyright information detection means detected is the same to mutual about two or more [above] channels.

[Claim 17] The above-mentioned input means is a signal processor according to claim 16 characterized by inputting the superposition signal which superimposed the copyright information which includes the same duplicate control information in each of a video channel and an audio channel at least by digital-watermarking processing.

[Claim 18] As opposed to the HARASHIN number about the contents which have two or more channels by digital-watermarking processing The superposition signal which superimposed the same copyright information is inputted into at least two or more channels. The above-mentioned copyright information on each channel is detected from the regenerative signal which generated and generated the regenerative signal of each channel from the inputted superposition signal. The signal-processing approach

characterized by outputting the regenerative signal of each channel when the detected above-mentioned copyright information is the same to mutual about two or more [above] channels.

[Claim 19] The signal-processing approach according to claim 18 characterized by inputting the superposition signal which superimposed the copyright information which includes the same duplicate control information in each of a video channel and an audio channel at least by digital-watermarking processing.

[Claim 20] As opposed to the HARASHIN number about the contents which have two or more channels by digital-watermarking processing An input means to input into at least two or more channels the superposition signal which superimposed ID information which shows that they are the same contents, A playback means to generate the regenerative signal of each channel from the inputted superposition signal, The signal processor characterized by having an ID detection means to detect the above-mentioned ID information from the generated regenerative signal, and the control means which outputs the regenerative signal of each channel when the above-mentioned ID information which the above-mentioned ID detection means detected is the same to mutual about two or more [above] channels.

[Claim 21] the signal processor according to claim 20 to which the above-mentioned input means is characterized by inputting the superposition signal which superimposed ID information which shows that it is alike, respectively and they are [of a video channel and an audio channel] the same contents at least by digital-watermarking processing.

[Claim 22] As opposed to the HARASHIN number about the contents which have two or more channels by digital-watermarking processing The superposition signal which superimposed ID information which shows that they are the same contents is inputted into at least two or more channels. The signal-processing approach characterized by outputting the superposition signal inputted from the inputted superposition signal when ID information which detected and detected ID information from the above-mentioned superposition signal which generated the regenerative signal of each channel and was generated was the same to mutual about two or more [above] channels.

[Claim 23] the signal-processing approach according to claim 22 characterized by inputting the superposition signal which superimposed ID information which shows that it is alike, respectively and they are [of a video channel and an audio channel] the same contents at least by digital-watermarking processing.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the configuration of a DVD regenerative apparatus.

[Drawing 2] It is the block diagram showing other configurations of a DVD regenerative apparatus.

[Drawing 3] It is the block diagram showing the example of 1 configuration of a recording apparatus.

[Drawing 4] It is a block diagram for explaining the playback limit in the case of reproducing DVD in the system of a personal computer.

[Description of Notations]

10 20 A DVD regenerative apparatus, 1 DVD, 2 DVD driver, 3, and 3A regeneration circuit, 4 A CSS decoder, 5 An MPEG decoder, 6 7 A media type decoder, 8 9 WM detection / Lien code section, 15 11 The output-control section, 12 13 A switch, 14 A CGMS-D decoder, 30 Recording device

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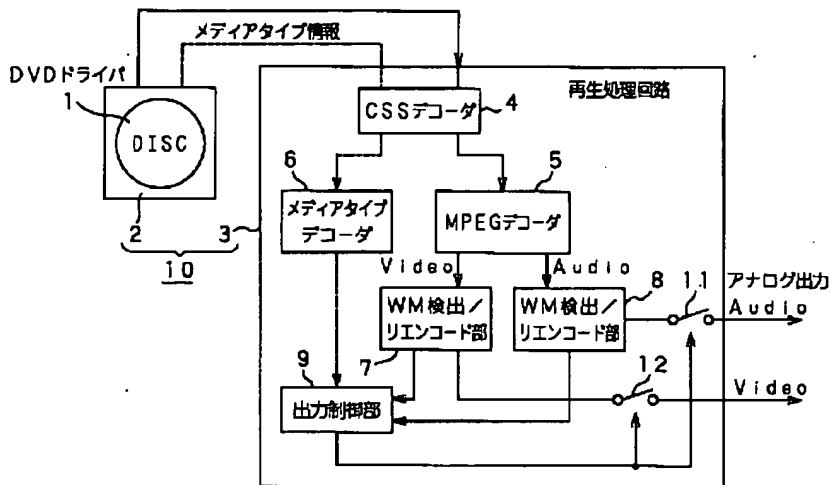
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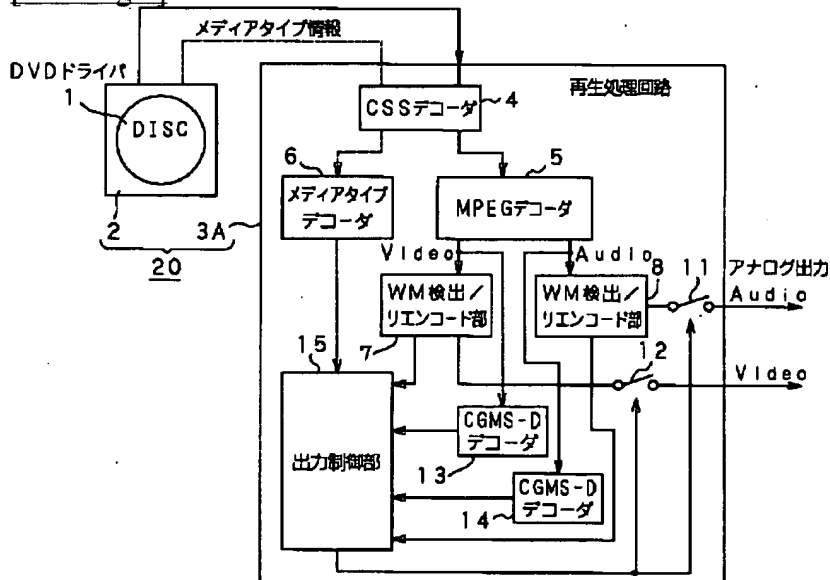
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DRAWINGS

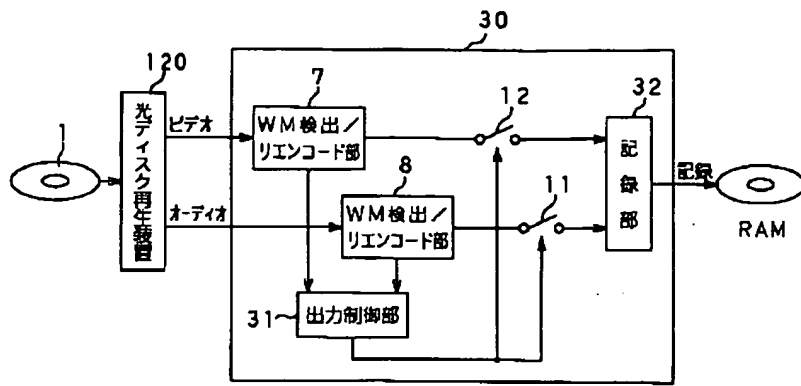
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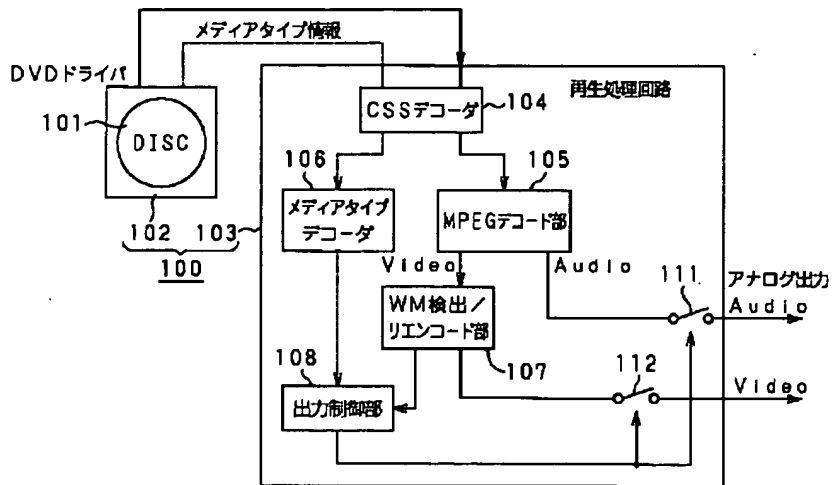
[Drawing 2]



[Drawing 3]



[Drawing 4]



[Translation done.]